



FEATURES

- Up to 30A switching in SPST and 20A switching in SPDT arrangements.
- Choice of silver or silver cadmium oxide contacts.
- Available as an open-frame relay, with a snap-on dust cover or with an immersion cleanable^(note 6), plastic sealed case.
- Meets UL 508 & UL 873 spacing - 1/8" through air, 1/8" over surface. (1/4" over surface with terminal code 4)
- UL class F insulation standard.
- Well suited for various industrial, commercial and residential applications, as well as many other.

CONTACT DATA @ 25 C

Arrangements: 1 Form A (SPST-NO) and 1 Form C (SPDT).

Material: Code 1 - Silver; Code 2 - Silver-cadmium oxide.

Mechanical Life: 10 million operations, typical.

TYPICAL ELECTRICAL LOAD & LIFE
(Open style relay)

Operations	Contact Load	Type of Load	Contact Form
Silver Cadmium Oxide Contacts			
100,000	30A @ 240VAC	UL General Purpose	Form A
100,000	20A @ 240VAC	Resistive Heater	Form A
100,000	20A/10A @ 240VAC	UL General Purpose	NO/NC Form C
100,000	20A/10A @ 28VDC	Resistive	NO/NC Form C
Silver Contacts			
100,000	10A/5A @ 240VAC	Resistive	NO/NC Form C
100,000	10A/5A @ 28VDC	Resistive	NO/NC Form C

Minimum Contact Load:

Silver Contacts: 500mA @ 5VDC or 12VAC.

Silver Cadmium Oxide Contacts: 1A @ 5VDC or 12VAC.

Initial Contact Resistance: 75 mΩ, max., @ min. rated current (switched).

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 1,500V rms.

Between Contacts and Coil: 1,500V rms.

INITIAL INSULATION RESISTANCE

Between Mutually Insulated Elements: 10%r9%r ohms, min., @ 500VDC, 25°C and 50% R.H.

COIL DATA @ 25 C

Voltage: 5 to 110VDC.

Maximum Coil Power: 2.8 Watt

Maximum Coil Temperature^(note 5): Class F: 140°C.

Duty Cycle: Continuous.

COIL DATA

Nominal Voltage (VDC)	Resistance ± 10% (Ohms)	Nominal Power (mW)	Nominal Current (mA)
5	27	930	185
6	40	900	150
9	97	840	93
12	155	930	77
15	256	880	59
18	380	850	47
24	660	870	36
48	2,560	900	19
110	13,450	900	8

OPERATE DATA @ 25 C

Must Operate Voltage: 75% of nominal voltage or less.

Must Release Voltage: 10% of nominal voltage or more.

Operate Time (Including Bounce)??: 15 ms, max.

Release Time (Including Bounce)??: 15 ms, max.

At or From Nominal Coil Voltage

T90 series

LOW COST, 30 AMP

PRINTED CIRCUIT BOARD RELAY

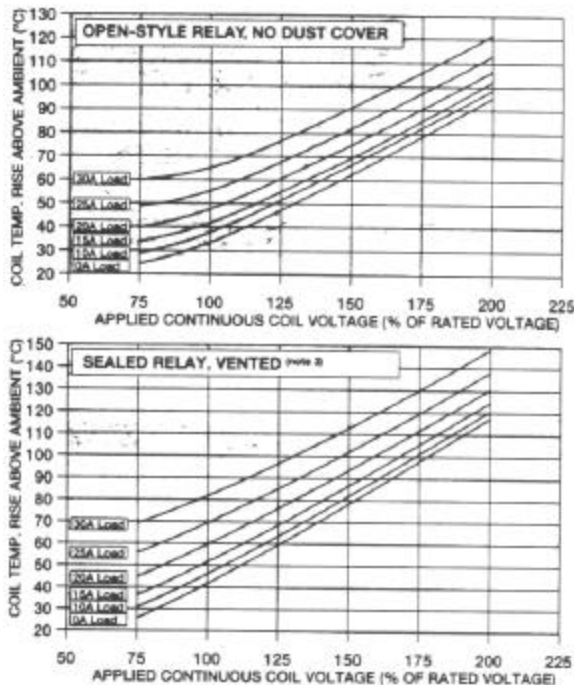
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Patented

TYPICAL COIL TEMPERATURE RISE

Data below are average values and should be verified in application. Tests were conducted within a 2' (.6 m) cube (still air) with relay mounted to a 30A, single side P.C. board^(note 6); at nominal coil power @ 25°C; with normally open contact loaded; and with 4' (1.22 m) long, #10 AWG load wires.



ENVIRONMENTAL DATA

Storage Temperature Range: 40°C to 130°C.

Operating Temperature Range: -55°C to +85°C^(note 1)

Vibration, Operational: 0.065" (1.65 mm) max. excursions from 10-55 Hz. with no contact opening >100 i.s.

Shock, Operational: 10 g for 11 ms with no contact opening > 100 i.s.

Shock, Mechanical: 100 g.

MECHANICAL DATA

Termination: Printed circuit terminals^(note 4).

Enclosures (all have 94V-O flammability rating, Class F temp. rating):

Optional dust cover: Snap-on plastic dust cover is available for use on open style T90N.

Sealed case (T90S): Immersion cleanable, tape sealed plastic case^(note 2).

Weight: Open Model T90N: 0.7 oz. (20 g) approximately.

Sealed Model T90S: 0.9 oz. (26 g) approximately.

NOTES

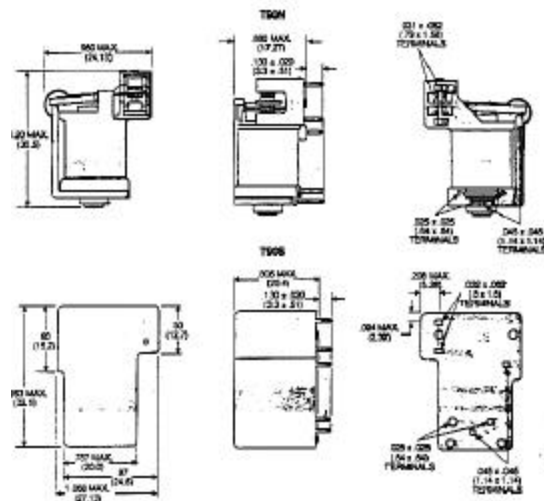
- 1.) Operating ambient temperature must consider "Must Operate Voltage Change Over Temperature," Contact Temperature Rise, Coil Temperature Rise (if coil is not allowed to cool) and Maximum Coil Temperature. Specification ambient considers nominal coil voltage. 20A load with coil cooled to ambient.
- 2.) Sealed relay terminals should not be bent.
- 3.) Vent tape should be removed after cleaning process for optimum life of sealed relays.
- 4.) Maximum soldering temperature is 500°F for 4 seconds.
- 5.) Class F coils are UL systems approved for maximum coil temperature of 140°C by change of resistance method.
- 6.) See application note 13C265 for proper relay mounting, termination, cleaning and PC board conductor width. Coil rise test performed with 30A PC board to maintain 20°C maximum rise @ 30A.

ORDERING INFORMATION

Typical Part Number>		T90	S	5	D	1	2	-24
1. BASIC SERIES: T90 = Printed circuit board power relay.								
2. ENCLOSURE: N = Open, no cover (snap-on dust cover available as an option). S = Immersion cleanable, tape sealed plastic case.								
3. CONTACT ARRANGEMENT: 1 = 1 Form A (SPST-NO). 5 = 1 Form C (SPDT).								
4. COIL INPUT: D = DC Voltage.								
5. TERMINALS: 1 = Printed circuit terminals. 4 = Printed circuit terminals, no common terminal between coil terminals (see wiring diagram). Note: Terminal code 4 recommended for UL 873 applications. Consult factory for use of terminal code 1 for UL 873 applications.								
6. CONTACT MATERIAL: 1 = Silver. 2 = Silver-cadmium oxide.								
7. COIL VOLTAGE: 5 = 5V DC 8 = 6V DC 9 = 9V DC 12 = 12V DC 15 = 15V DC 18 = 18V DC 24 = 24V DC 48 = 48V DC 110 = 110V DC								

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery.

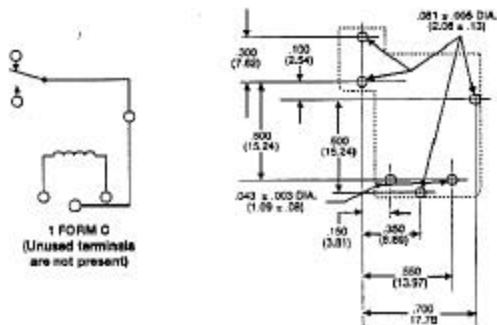
T90N1D12-5	T90N5D11-12	T90N5D12-12	T90N5D12-110	T90S1D12-12	T90SSD12-12	T90SSD12-110
T90N1D12-12	T90N5D11-24	T90N5D12-24	T90N5D42-24	T90S1D12-24	T90SSD12-24	T90SSD42-24
T90N1D12-24	T90N5D12-5	T90N5D12-48	T90S1D12-5	T90S5D12-5	T90SSD12-48	

OUTLINE DIMENSIONS**OPTIONAL DUST COVER FOR USE WITH OPEN-STYLE RELAYS**

Optional plastic dust cover is a snap-on unit, open on the PC board side of the relay. The cover, when ordered with the relay, is shipped separately. It is designed to be snapped into place by the customer after the relay has been assembled to the PC board.

COVER ORDERING INFORMATION - Boldface items are stocked.

Part No.	Description
35C620A	Black dust cover for use on open-style, T90N relay.

**WIRING DIAGRAM & PC BOARD LAYOUT (Bottom Views)****UL & CSA CONTACT RATINGS**

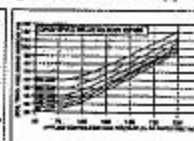
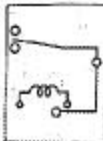
Voltage	Load Type	N.C. Contact	N.C. Contact
Silver Contacts			
240VAC	General Purpose	10A	5A
240VAC	Resistive	10A	5A
28VDC	Resistive	10A	5A
Silver-Cadmium Oxide Contacts			
240VAC	General Purpose†	30A	15A
240VAC	UL Resistive†	30A	15A
120VAC	Motor	1 HP	1/4 HP
240VAC	Motor	2 HP	1/2 HP
240VAC	LRA/FLAT	80/30	30/10
240VAC	Tungsten	TV5	TV3
277VAC	Ballast	6A	3A
28VDC	Resistive	20A	10A

† For Form C application, derate current to 67%.

T90 Series

An inexpensive means of switching loads up to 30 amps. While these small, low-cost relays are designed primarily for the appliance industry and heating, ventilating and air conditioning markets, they are also well suited for automotive load management and other applications.

- Electrical life expectancy is 100,000 operations at rated loads
- PC board terminals • UL class F insulation standard
- Mechanical life expectancy is 10 million operations
- Dielectric strength: 1,500Vrms (between contact and coil)
- Operating temperature:
134831/134948: -40°C to +85°C;
104926/129349: -40°C to +125°C
- 104926: Open frame relay
- 129349: Immersion cleanable, plastic sealed case



129349

129349

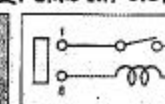
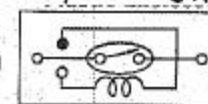
134828

104926

Part Number	Potter & Brumfield Equivalent	Coil Voltage	Coil (Ohms)	Contact Voltage	Contact Current	Pins	Terminal Type	L x W x H (in.)	Style	Pricing			
										1-9	10-49	50-99	100+
134949	T905012-5	5VDC	27	240VAC/28VDC	30A	6	PCB Solder	1.3 x 1.1 x .80	SPDT	\$2.95	\$2.49	\$1.95	\$1.75
104926	T90N5D12	12VDC	155	240VAC/28VDC	30A/20A	6	PCB Solder	1.2 x .90 x .63	SPDT	2.95	2.49	2.25	1.65
129349	T9055D12-12	12VDC	155	277VAC/28VDC	20A	6	PCB Solder	1.2 x 1.0 x .75	SPDT	3.25	2.75	2.49	1.89
134931	T9055D12-24	24VDC	660	240VAC/28VDC	30A	6	PCB Solder	1.3 x 1.1 x .80	SPDT	2.95	2.49	2.25	1.95

129349 T9055D12-12 12VDC 155 240VAC/28VDC 30A 6 PCB SOLDER 1.2x1.0x.75 SPDT 2.95 2.49 2.25 1.95

- Dielectric strength: 500VDC (between contact and coil)
- Operating temperature: -35°C to +85°C • SPST
- Choice of normally open (NO), normally closed (NC)
- 29575 standard lead length .142"
- 117946 cut leads .100"



129955

129955

29575

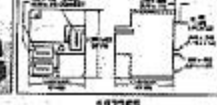
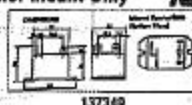
29575

Part Number	Product Number	Manufacturer	Coil Voltage	Coil (Ohms)	Contact Voltage	Contact Current	Pins	Terminal Type	L x W x H (in.)	Style	Pricing			
											1-9	10-49	50-99	100+
129955	P3R	Prime Source	5VDC	500	500VAC/200VDC	0.5A	4	PCB Solder	1.0 x .35 x .30	SPST(NC)				\$1.25
111448	RC108T	Han Kwik	12VDC	550	250VAC/150VDC	0.1A	4	PCB Solder	1.0 x .37 x .38	SPST(NC)	.59	.45	.35	.25
134955	R4422-2	Electrol	12VDC	440	250VDC	1.0A	6	PCB Solder	1.0 x .35 x .25	DPST(NC)	.99	.79	.65	.45
29575	RRJ10317	Standex*	12VDC	730	250VAC/150VDC	0.1A	4	PCB Solder	1.1 x .47 x .36	SPST(NC)	.99	.79	.65	.55
117946	RRJ10317CL	Standex**	12VDC	730	250VAC/150VDC	0.1A	4	PCB Solder	1.1 x .47 x .36	SPST(NC)	.49	.35	.25	.15

T9A Series

Low Cost 30 Amp PC Board or Panel Mount Only

- Mechanical life expectancy is 10 million operations
- 137349: • Operating temperature: -40°C to +70°C
- Dielectric strength: 1200VAC (between open contacts)
- 137365/137357: • Operating temperature: -55°C to +85°C
- Dielectric strength: 1500VAC (between open contacts)



137349

137349

137365

137365

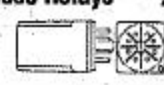
137357

Part Number	Potter & Brumfield Equivalent	Coil Voltage	Coil (Ohms)	Contact Voltage	Contact Current	Pins	Terminal Type	L x W x H (in.)	Style	Pricing			
										1-9	10-49	50-99	100+
137349	T9AP1D52-12	12VDC	120	250VAC/28VDC	30A	4	.28" disconnect(2) .187" disconnect(2)	2.0 x 1.25 x 1.25	SPST(NC)	\$4.95	\$4.49	\$3.95	\$3.49
137365	T9ASSD22-12	12VDC	155	240VAC/28VDC	NO: 20A NC: 10A	5	PCB Solder (5) .25" disconnect(3)	1.25 x 1.0 x 1.25	SPDT	2.95	2.49	2.25	1.95
137357	T9ASSD52-12	12VDC	155	240VAC/28VDC	NO: 20A NC: 10A	5	Solderless Quick Connect	2.0 x 1.16 x 1.8	SPDT	2.95	2.49	2.25	1.95

See page 44 for Relay Sockets

General Purpose Relays

- Contact current: 10 amp • Weight: 0.2 lbs.
- Pin Type Terminals - Series 250
- Plug-in mounting with see-through dust covers • High dielectric strength
- AC or DC operated coils • Ambient temperature operating: -10°C to +50°C



139740

Part No.	Product No.	Cross Reference	Coil (voltage)	Coil (Ohms)	Pins	Terminal Type	L x W x H (in.)	Style	Pricing			
									1-9	10-24	25-49	
139766	W250CPX6	R02-11D10-12	12VDC	120Ω	8	Pin type	1.4 x 1.4 x 2.7	DPDT	\$8.95	\$7.95	\$6.95	
139762	W250CPX10	R02-14D10-12	12VDC	120Ω	11	Pin type	1.4 x 1.4 x 2.7	3PDT	9.95	8.25	7.75	
139774	W250CPX7	R02-11D10-24	24VDC	470Ω	8	Pin type	1.4 x 1.4 x 2.7	DPDT	9.49	7.95	7.25	
139731	W250ACPX6	R02-11A10-24	24VAC	85Ω	8	Pin type	1.4 x 1.4 x 2.7	DPDT	9.49	7.95	7.25	
139740	W250ACPX9	R02-11A10-120	120VAC	1.9KΩ	8	Pin type	1.4 x 1.4 x 2.7	DPDT	9.49	7.95	7.25	
139758	W250ACPX14	R02-14A10-120	120VAC	1.7KΩ	11	Pin type	1.4 x 1.4 x 2.7	3PDT	9.95	8.95	7.25	

Quick Connect Blade Terminals - Series 388

- Class 388 general purpose relays are an inexpensive high performing line of relays.
- Flat terminals (0.187" x 0.020") for standard plug-in mounting also accept quick-connect receptacles or direct soldering.
- Ambient temperature operating: -30°C to +50°C • See page 44 for sockets



139896

Part No.	Product No.	Cross Reference	Coil (voltage)	Coil (Ohms)	Pins	Terminal Type	L x W x H (in.)	Style	Pricing			
									1-9	10-24	25-49	
139846	W388CPX10	R10-14D10-12	12VDC	120Ω	11	Quick connect	1.5 x 1.4 x 2.2	3PDT	\$9.49	\$7.95	\$7.25	
139862	W388CPX7	R10-11D10-24	24VDC	460Ω	8	Quick connect	1.5 x 1.4 x 2.2	DPDT	8.95	7.25	6.49	
139854	W388CPX11	R10-14D10-24	24VDC	470Ω	11	Quick connect	1.5 x 1.4 x 2.2	3PDT	9.49	7.95	7.25	
139820	W388ACPX13	R10-14A10-24	24VAC	70Ω	11	Quick connect	1.5 x 1.4 x 2.2	3PDT	9.49	7.95	7.25	
139838	W388ACPX14	R10-14A10-120	120VAC	2.1KΩ	11	Quick connect	1.5 x 1.4 x 2.2	3PDT	9.49	7.95	7.25	

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